

July 1, 1999

Memo To: Rich Cook, U.S. Environmental Protection Agency

From: Philip Heirigs, Sierra Research
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Subject: Error in Work Assignment #0-07 Toxics Emissions Estimates for
Areas Using Federal Reformulated Gasoline

Under Work Assignment 0-07 (WA#0-07) of Contract #68-C7-0051, Sierra Research, in conjunction with its subcontractor Radian Corporation, performed a number of analytical tasks related to the assessment of motor vehicle air toxics emissions, exposure, and risk. The results of that assessment and a description of the methodologies used to develop the emissions and exposure estimates are described in the final report prepared for that work assignment, "Estimation of Motor Vehicle Toxic Emissions and Exposure in Selected Urban Areas," (October 15, 1998).

As you know, Sierra and Radian are currently updating the toxics emissions and exposure estimates prepared in WA#0-07 to be consistent with the final emission factors and fuel scenarios developed by EPA to support the Tier 2 rulemaking. During this update, it was discovered that the MOBILE-based input files developed for WA#0-07 were incorrectly formatted for areas that use federal reformulated gasoline (RFG). As described in the final report for WA#0-07, the impacts of fuel formulation changes on exhaust toxic emission rates are inherently accounted for in the "toxic-TOG" curves. As a result, it is unnecessary to set the RFG flag in the MOBILE-based input files used in the toxics model to 2 for areas that use RFG. However, the RFG areas modeled in WA#0-07 were inadvertently coded with the RFG flag set to 2, which has the effect of overestimating the benefits of RFG on toxics emission rates.

To determine the impact of this error on the toxics emissions estimates prepared in WA#0-07, the T2ATTOX model was re-run for Chicago with the RFG flag correctly set to 1. Overall, fleet-average toxics emission rates (for a given calendar year and control scenario) increased by about 10% with this correction. However, as observed in Figure 1, which shows benzene emissions over time for the baseline case, and in Figure 2, which shows 1,3-butadiene emissions over time for control scenario 2 (i.e., Tier 2 control with a 40 ppm national sulfur cap), the general trend in emissions estimates does not change – there is a significant reduction in toxics between 1990 and 2020 as a result of fleet turnover. In addition, this correction has a very small impact on the relative benefits of the various control scenarios modeled in WA#0-07. For example, the fractional benefit of scenario 2 relative to the baseline case for benzene in 2007 was 9.5% in the original analysis and is 9.4% in the corrected analysis. Thus, the conclusions reached in the original report remain unchanged.

Figure 1

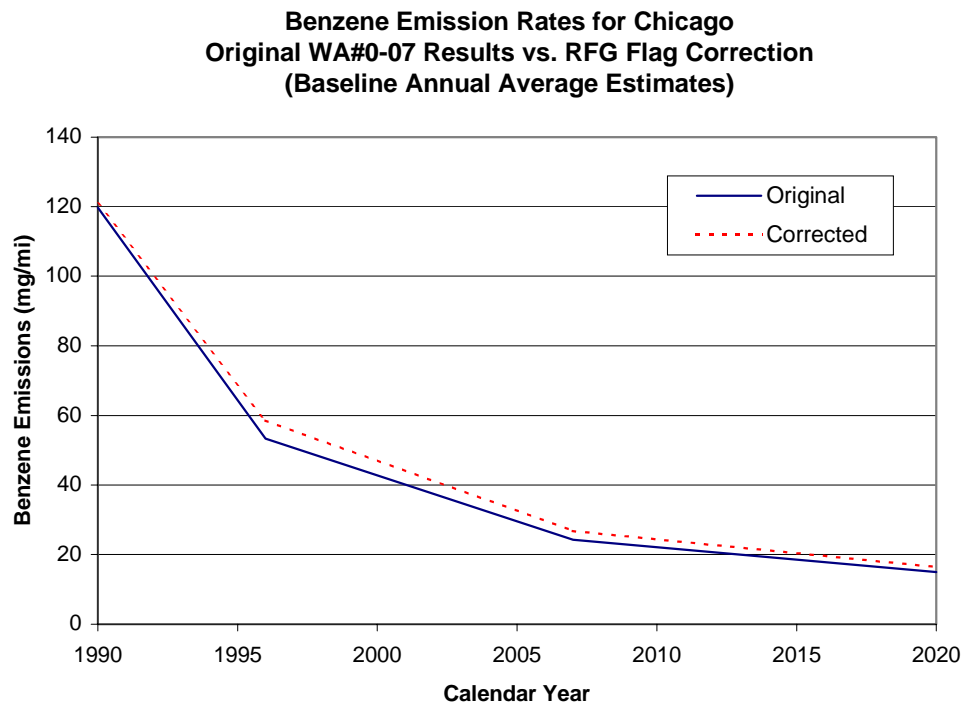


Figure 2

